

OVERLOOKED SPECIES, TRANSFERS AND  
NOVELTIES IN THE FLORA OF  
EASTERN NORTH AMERICA

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(Continued from page 21)

SMILAX PSEUDO-CHINA L. Sp. Pl. 1031 (1753). *S. tamnifolia*  
Michx. Fl. Bor.-Am. ii. 238 (1803). PLATE 812.

*Smilax Pseudo-China*, named from resemblance to the Asiatic *Smilax China* L., the *China radix* of Bauhin, was included, along with *S. lanceolata* L., by Linnaeus in a section of the genus with unarmed terete stems. The treatment was as follows:

\**Caule inermi tereti*

13. SMILAX caule inermi tereti, foliis inermibus: caulinis *Pseudo Chi-*  
cordatis, racemis [corrected to rameis in ed. 2] *na*  
ovato-oblongis.

*Smilax* [misprinted *Simlax*] caule tereti inermi, foliis inermibus: caulinis  
cordatis, ramorum lanceolatis, pedunculis longissimis. *Gron. virg.* 193.

*Smilax* caule tereti inermi, foliis cordato-ovatis acutis inermibus,  
petiolis bidentatis. *Hort. Cliff.* 495. *Gron. virg.* 120.

*Smilax virginiana*, spinis innocuis armata, latis canellae foliis, radice  
arundinacea crassa nodosa & carnosae. *Pluk. alm.* 349, t. 110. f. 5.

*Smilax aspera*, fructu nigro, radice nodosa magna laevi farinacea.  
*Sloan. jam.* 105. *hist.* 1. p. 231. t. 143. f. 1.

*China spuria nodosa.* *Bauh. pin.* 297.

*Habitat in* Virginia, Jamaica.

It is at once evident that, as usual, Linnaeus had no clear understanding of American species and that his citations covered different species. The phrase "Caule inermi" of his major grouping of the primary diagnosis (of the plant he had actually before him in his own herbarium), of the quotations from Gronovius and from Linnaeus' Hortus Cliffortianus at once contrast with "spinis . . . armata" of the Plukenet reference and "Smilax aspera" of Sloane. Singularly enough, Alphonse De Candolle in his *Smilacées* in DC. Mon. Phan. i. 82 (1878), although saying "Linn. Sp. p. 1461 [ed. 2], excl. syn. post Gronov.", placed it, along with *S. rotundifolia*, *S. glauca*, etc. in the group with "Folia persistentia vel subpersistentia" and described it "aculeis in caule crebris; . . . limbis margine setaceo-ciliatis". In other words the *S. Pseudo-China*, sensu A. DC. (and many followers), not L., is *S. Bona-nox* L., which was

originally described "foliis ciliato-aculeatis." It, therefore, becomes necessary to determine what Linnaeus actually had in his own herbarium prior to 1753. Fortunately there is a characteristic sheet of foliage marked by Linnaeus "K. *Pseudo-China*". This, undoubtedly collected by Kalm ("K") in New Jersey or Delaware, is characteristic *S. tamnifolia* Michx. Fl. Bor.-Am. ii. 238 (1803). A portion of the Linnean TYPE is reproduced as our FIG. 2. The first Gronovian reference given by Linnaeus is supported by a fruiting branch in the herbarium of Gronovius at the British Museum, badly crumpled and unsightly, also by a very beautiful flowering plant (our FIG. 1). These are likewise *S. tamnifolia* with very long peduncles. The third reference, to Hortus Cliffortianus, carries back to the Plukenet figure cited by Linnaeus, which is of some woody species, presumably *S. Walteri* Pursh, since its foliage will do for that species and, in the place cited, Pluketet identified it with Virginian specimens with "baccis coccineis"; and the second Linnean reference to Gronovius is supported by a characteristic lateral sprig of flowering *S. rotundifolia*! The *Smilax aspera* of Sloane need not specially concern us, since it is so clear that the primary material, the plant which Linnaeus had in his own herbarium and the two Clayton (Gronovian) specimens with smooth stems are so definitely the true type and syntypes of *S. Pseudo-China*. The beautiful photograph sent from Paris of the type of *S. tamnifolia* Michx. is unequivocal. It is, consequently, worth noting that Michaux thought it might be the *S. caule tereti, foliis inermibus: caulinis cordatis, ramorum lanceolatis, pedunculis longissimis* of Gronovius (our FIG. 1). The point which Michaux did not note is, that this was the best syntype of *S. Pseudo-China* L. (1753).

Further showing the utter confusion of Linnaeus in interpreting North American species of *Smilax* is the fact that, although he described in his section with *Caule aculeato, tereti* a new species as *S. tamnoides* L. Sp. Pl. 1030 (1753), the specimen in his own herbarium marked *S. tamnoides* is an unusually good piece of unarmed, herbaceous-stemmed *S. Pseudo-China* (*S. tamnifolia* Michx.) while the Catesby plate, from which the characters were obviously drawn, is of a prickly-stemmed, evergreen, high-climbing and broad- and eciliate-leaved extreme of an-

other species! In fact, the specimen preserved by Linnaeus as representing his *S. tamnoides* not only has the unarmed stem, the slightly panduriform leaves, the long peduncles and loosely globose inflorescence of *S. Pseudo-China* (*S. tamnifolia* Michx.). One of its inflorescences even shows with diagrammatic sharpness the elongate-clavate styles of that species.

In my conclusion that the plants selected are the real types of *Smilax Pseudo-China* I am quite in agreement with Dr. Pennell who, in 1916, wrote:

*Smilax Pseudo China* L. l. c. 1031. 1753. "Habitat in Virginia, Jamaica." Species clearly aggregate, represented in the Linnean herbarium by specimens written up by Linnaeus as follows, according to a letter of B. D. Jackson: "three sheets pinned together; the first is 'II K Pseudo China', it is a barren branch, the leaves leathery; the second sheet is written up 'II' and seems quite the same plant as the former, but has one berry, the third sheet is of a West Indian species, coll. by Patrick Browne in Jamaica, probably *S. celastroides*." From the wording of the Linnaean description none of these can be considered the type of *S. Pseudo China*, but this would be rather a specimen of Gronovius, also studied by Linnaeus, now in the Gronovian herbarium in the British Museum. The description of Linnaeus is word for word from Gronovius, except for the addition of the phrase "racemis ovato-oblongis," inappropriate for any *Smilax* whatever. "Smilax caule tereti inermi: foliis inermibus, caulinis cordatis, ramorum lanceolatis; pedunculis longissimis," Gronovius, Fl. Virg. 156. 1742, citing Clayton's Nos. 541, 561 and 630, is represented in the herbarium by Nos. 561 and 630 (for No. 541 see above note under *S. herbacea*). These two numbers are identified by Dr. A. B. Rendle as both the same as No. 541, that is, as genuine *Smilax herbacea* L. For the verification of these two Linnaean types I am indebted to Dr. B. Dayden Jackson, of the Linnaean Society of London, and to Dr. A. B. Rendle, of the British Museum.—Pennell in Bull. Torr. Bot. Cl. xliii. 413, 414 (1916).

Unfortunately, Pennell did not himself see the specimens discussed; had he done so he certainly would not have reduced *Smilax Pseudo-China*, correctly typified by him, to *S. herbacea* L. He depended upon identifications by the late Drs. B. Daydon Jackson and A. B. Rendle, neither of whom clearly understood the species involved. The plant generally passing as *S. herbacea* rarely if ever has any tendency to panduriform leaves. Its leaves, varying from oblong-ovate to cordate-subrotund, are glaucous and glabrous beneath, the flowers much larger than in *S. Pseudo-China*, with the styles rather broadly lingulate, the berries glaucous. Whether the type of *S. herbacea*, from Vir-

ginia (*Clayton*), is of this species (*S. pedunculata* Muhl.) or *S. pulverulenta* Michx. can be determined only by actual (future) examination of the material. The two photographs of the specimens (one sheet in Herb. L., the other in the Gronovian Herbarium) are of identical plants. The foliage is young, but it looks green and lustrous beneath, as in *S. pulverulenta* Michx. Until the specimens can be actually studied we may retain the names *S. herbacea* and *S. pulverulenta* as currently used.

Although Pennell, l. c. 414, placed *Smilax inermis* Walt. Fl. Carol. 244 (1788), as well as *S. Pseudo-China*, in the synonymy of *S. herbacea*, rather than place them with *S. tamnifolia*, it now seems clear that Walter's species was identical with *S. Pseudo-China*. Pennell said "Type, presumably from Berkeley County, South Carolina, not verified". Walter's diagnosis was perfectly good for *S. Pseudo-China*; Berkeley County is on the outer Coastal Plain and it is notable that Pennell's only stations, in his early paper, for *S. herbacea* from Virginia (south of Fairfax County) North Carolina, South Carolina and Georgia were all from along the Blue Ridge or the Alleghenies, while he specially designated the area of *S. tamnifolia* as "Coastal Plain; Long Island to South Carolina". In the Gray Herbarium, as in those studied by Pennell, there is no so-called *S. herbacea* from the Coastal Plain from south of Virginia. Walter's *S. inermis*, "presumably from Berkeley County, South Carolina", had the weak ("infirm") stem only 3 feet high ("tripedali"). The southernmost specimens in the Gray Herbarium of *S. Pseudo-China* are three from Berkeley County, South Carolina (Santee Canal, *Ravenel*; west of Chicora, *Godfrey & Tryon*, no. 868; Moncks Corners, *Godfrey & Tryon*, no. 1411), one from Charleston County, South Carolina (north-northwest of McClellanville, *Godfrey & Tryon*, no. 1112) and one from eastern Georgia (Savannah, *Mrs. Say*). Incidentally there are in the Gray Herbarium no specimens (not even from Wilmington) from North Carolina and Pennell saw none from that state. Is it really absent from or rare in the broad area between southern South Carolina and southeastern Virginia? This gap is frequent in the known ranges of many species.

NEMEXIS ELLIPTICA Raf. Aut. Bot. 131 (1840) with stem "6 to 12 inches high, leaves uncial", the stem with quadrate, elliptic

leaves acute at each end, from Alabama, might have been *Smilax Hugerii* (Small) J. B. Norton in Pennell in Bull. Torr. Bot. Cl. xliii. 420 (1915), based upon *Nemexia Hugerii* Small (1903). Since the combination *Smilax elliptica* already exists for other species Rafinesque's *Nemexis elliptica* need not disturb us, but by those who maintain *Nemexia* as a genus it must be considered.

Another and quite clear synonym of *Smilax Hugerii* is *S. herbacea* sensu Walt. Fl. Carol. 243 (1788), not L. His "caule annuo inerme stricto suberecto 2-5 pedali, simplici, foliis verticillatis ovatis . . . cirrhis obsoletis", etc. are unequivocal for a plant which is well known from southern and southeastern South Carolina and from Georgia.

**SMILAX BONA-NOX L., var. *exauriculata*, var. nov.** (TAB. 811, FIG. 3), foliis oblongo-lanceolatis subacuminatis basi cordatis nec panduriformibus, margine setoso-ciliatis.—VIRGINIA: Norfolk, *Reed?* (TYPE in Herb. Gray.).

*S. BONA-NOX*, var. ***hederaefolia*** (Beyrich), comb. nov. *S. hederaefolia* Beyrich ex Kunth, Enum. v. 209 (1850). *S. Bona-nox*, subsp. *hederaefolia* (Beyrich) A. DC. in DC. Mon. i. 77 (1878).

As it extends northward into eastern Virginia (more locally northward) *Smilax Bona-nox* is nearly as variable as farther south. In this northeastern area of its broad dispersal it occurs in three (perhaps four) quite definite variations. Typical *S. Bona-nox* L. Sp. Pl. 1030 (1753) was, most exceptionally, not so much confused as most of Linnaeus's North American species. Although he included a West Indian shrub of Bauhin, he gave the "*Habitat in Carolina*" and the species rests primarily on *Smilax, foliis latis in margine spinosis, caroliniana, stipite quadrato*, Pluk. Alm. 348, t. 111, fig. 3; the Linnean diagnosis drawn directly from Plukenet: "SMILAX caule inermi [because Plukenet had merely a sterile tip] angulato, foliis ciliato-aculeatis." Typical *S. Bona-nox*, therefore, is the slender, straggling and rarely climbing, freely branched shrub with deltoid-ovate to slightly panduriform leaves usually mottled with white, the rounded basal lobes short and tapering into the upper part of the blade, the margins bristly-ciliate. Its northern limit seems to be in Wicomico County, Maryland (*J. J. Carter* in Herb. Phil. Acad.).

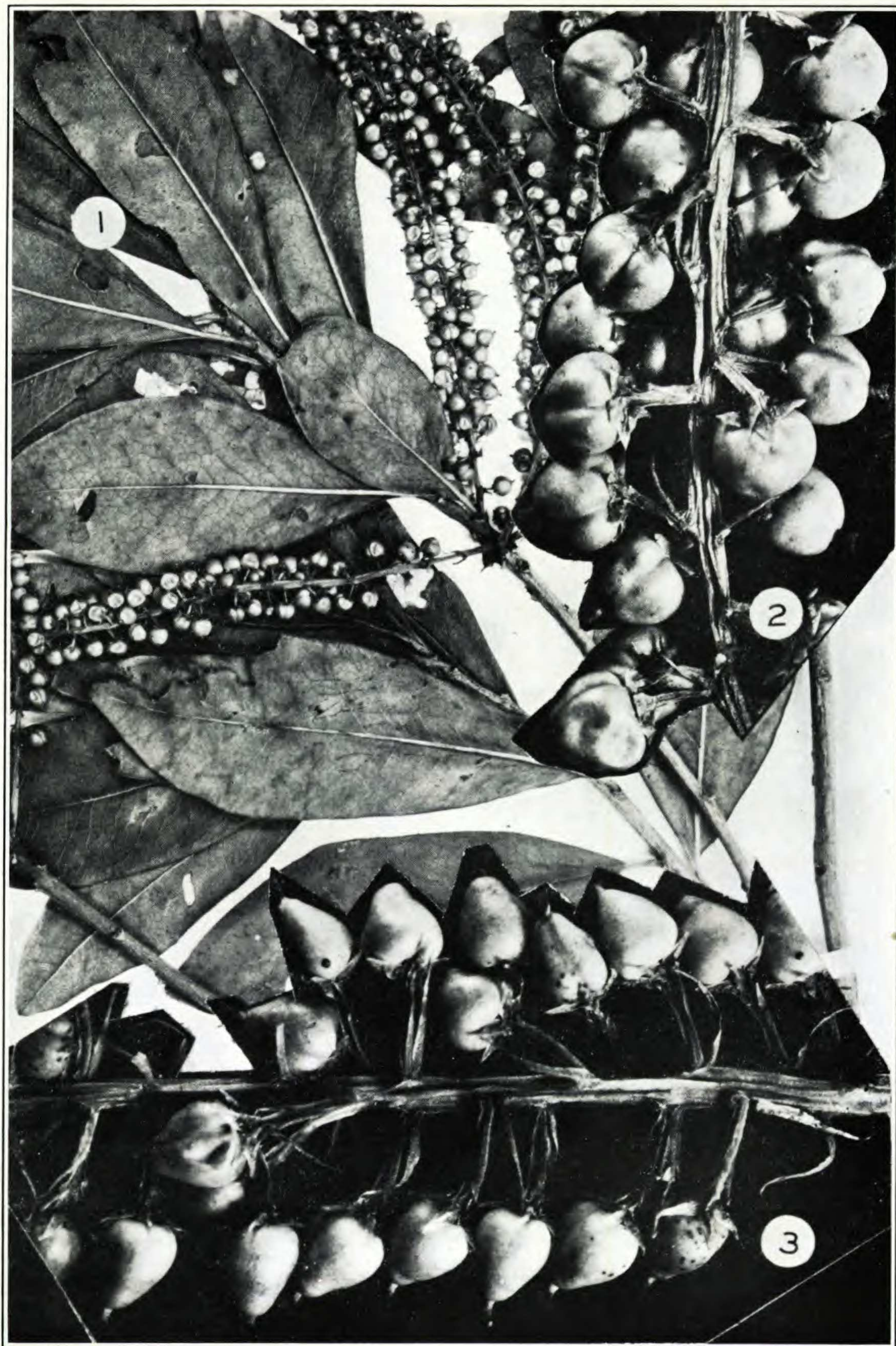


Photo. B. G. Schubert.

CYRILLA RACEMIFLORA: FIG. 3, fruit,  $\times 5$

Var. SUBGLOBOSA: FIG. 1, portion of fruiting branch,  $\times 1$ ; FIG. 2, fruit,  $\times 5$ ; both from TYPE



Photo. B. G. Schubert.

PHACELIA FALLAX, all figs. from TYPE: FIG. 1, portions of plant,  $\times 1$ ; FIG. 2, young inflorescence,  $\times 3$ ; FIG. 3, portion of mature calyx,  $\times 10$ ; FIG. 4, seed,  $\times 10$

Linnaeus picked up another of Plukenet's figures. This was *S. Bona-nox*  $\beta$ . of L. Sp. l. c. "Smilax caroliniana, stipite quadrato leni, foliis angustis asperis auriculatis ad basin angulosis. *Pluk. alm.* 348, t. 111. f. 3." Somewhat later this was taken up as a species: *S. hastata* Willd. Sp. iv<sup>2</sup>. 782 (1806); Willdenow emphasizing the point shown by Plukenet, that the very narrow leaves are "margine ciliato-aculeatis". This extreme with narrowly lanceolate bristly-ciliate blades with narrow divergent basal lobes occurs occasionally in the Carolinas and southward. The Virginia material is slightly transitional but may be called *S. Bona-nox*, var. *hastata* (Willd.) A. DC. in DC. Mon. i. 79 (1878).

The third variety with strongly bristly-ciliate leaves is the very extreme plant described above as var. *exauriculata*. The type material is an old sheet from Norfolk, collected probably by Reed who got in the neighborhood of Norfolk several species otherwise and not recently known from Virginia. Var. *exauriculata* is very extreme in having elongate oblong-lanceolate, tapering, ciliate-margined leaves with nearly parallel sides and cordate (not hastate or subhastate) bases. It piques the curiosity! The specimen was sent out as *S. hastata*, var. *lanceolata* Pursh. It can hardly be that, however. Pursh gave no new description; he was simply giving a name to the *S. lanceolata* Walt., perhaps not L.: "caule angulato spinoso; foliis longis angustis lanceolatis inermibus". Var. *exauriculata* could not be described "foliis inermibus". I am tentatively placing with it a sheet from "dry bank, Santee Canal, 5 miles west of Pineville, Berkeley County, South Carolina, *Godfrey & Tryon*, no. 630 (distrib. as *S. glauca*). Its leaves are chiefly oblong, rather than lanceolate.

The extreme of *Smilax Bona-nox* with "foliis inermibus" is a coarse and usually high-climbing shrub with ovate, deltoid or broadly panduriform leaves usually green above and with eciliate or very weakly and casually ciliate leaves on the fertile branches. Basal sprouts may have ciliate and mottled leaves but the foliage of the adult branches is rarely so. This often high-climbing vine has the leaves up to 8 (on sprouts to 12) cm. broad and in good development is very different from typical *S. Bona-nox*. It is var. *hederaefolia*, which rests on *S. hederaefolia* "Beyrich ined." ex Kunth (1850), treated by Alphonse DeCandolle as *S. Bona-nox*, subsp. *hederaefolia*. Beyrich's



original material was from shores of Savannah River, Georgia. To this citation DeCandolle added "Virginia (Rügel . . .)". Var. *hederaefolia* is the commonest extreme of the species. In southeastern Virginia it abounds on damp shores or in low woods, the typical form of the species preferring open and drier habitats. Var. *hederaefolia* reaches Delaware (*A. Commons* in *Herb. Phil. Acad.*) and is isolated on Nantucket Island in southeastern Massachusetts.

*Smilax tamnoides* L. Sp. Pl. 1030 (1753) was another species not understood by its author. His species rested upon two items: the first a specimen of the unarmed herbaceous plant which on the next page he described as *S. Pseudo-China*, the plant which has regularly passed as *S. tamnifolia* Michx. The second and sure basis of *S. tamnoides* was the description and plate of *Smilax Bryoniae nigrae* foliis, caule spinoso, baccis nigris of Catesby, *Carol. i.* 52, t. 52. Linnaeus took his brief diagnosis primarily from Catesby: "SMILAX caule aculeato tereti" and the species was placed by him in the section \**Caule aculeato, tereti*. There can be no question that the type of *S. tamnoides* was the Catesby plate.

Catesby's description was vivid:

This plant shoots forth with many pliant thorny stems; which, when at full bigness, are as big as a walking cane, and jointed; and rises to the height usually of twenty feet, climbing upon and spreading over the adjacent Trees and shrubs. . . . In Autumn it produces clusters of black round berries, hanging pendant to a foot-stalk, above three inches long," etc.

The only possible competitor is *S. Bona-nox*, var. *hederaefolia*, but that has square or at least 4-angled stems (Catesby's shrub terete), the leaves are strongly reticulate with prominent cross-veins (Catesby's not), and the fruiting peduncles are 1-3 cm. long, merely ascending to divergent or rarely recurved (Catesby's shrub with pendulous fruiting peduncles 5-6 cm. long, with pedicels much longer than in *S. Bona-nox*). Catesby's plate is a beautiful match for the terete-stemmed plant, with relatively thin though firm, and delicately veined often panduriform leaves, elongate, arching and finally drooping peduncles (up to 6.5 cm. long) and long pedicels, which occurs on the Coastal Plain from Florida to southeastern Virginia (perhaps farther north). This plant has been considered a variety of the wide-ranging, conti-

mental *S. hispida*, from which it differs in the development of some or many panduriform leaves. It has been designated in the Gray Herbarium by a critical student of the group as a southeastern variety of *S. hispida*, with an unpublished name indicative of its southern occurrence. In the Gray Herbarium there is no material of *S. tamnoides*, var. *hispida*<sup>1</sup> (*S. hispida*), the continental plant with leaves regularly ovate, from the Coastal Plain south of Virginia, where it extends from the interior down the calcareous valleys. All specimens from the Coastal Plain of Florida, Georgia and South Carolina have some or all of the leaves panduriform and are typical *S. tamnoides*. I have seen no such material from North Carolina.

Pursh, treating *Smilax tamnoides* as herbaceous (meaning *S. tamnifolia* Michx.) described as *S. pandurata* [he said us] Pursh, Fl. Am. Sept. i. 251 (1814), a species in his \*\**Caule fruticosa; ramis teretibus*. Pursh's brief description could have applied only to typical *S. tamnoides*:

14. *S. aculeata*; foliis ovato-panduraeformibus acuminatis 3-nervibus, pedunculo communi petiolo duplo longiore. *panduratus*.

In sandy woods, New Jersey to Carolina. ♀. July.  
v.v. Leaves smooth and shining on both sides.

NOTE ON SMILAX LANCEOLATA.—*S. lanceolata* L. Sp. Pl. 1031 (1753) was published as follows, under \**Caule inermi, tereti*:

12. SMILAX caule inermi tereti, foliis inermibus lanceolatis.  
*Hort. Cliff.* 459. *Gron. virg.* 120.

*Smilax*, viticulis asperis, virginiana, foliis angustis laevibus nullis auriculis praedita. *Pluk. alm.* 349 .t. 110. f. 4? *Raj suppl.* 344?

*Habitat in Virginia.*

*Differt nostra a Plukenetiana aculeorum absentia.*

Linnaeus himself, according to the late Dr. B. Daydon Jackson, had no material and my efforts to secure a photograph of the Hortus Cliffortianus and Gronovian plants have been unsuccessful. The Plukenet figure, cited by Linnaeus in *Hortus Cliffortianus* without query, is available and it is significant that Linnaeus stated that *S. lanceolata* differed from Plukenet's figure in lacking prickles. It should also be noted that *S. lanceolata* was from

<sup>1</sup> SMILAX TAMNOIDES L., var. *hispida* (Muhl.), stat. nov. *S. hispida* Muhl. ex Torr. Fl. N. Y. ii. 302 (1843).

Virginia. During ten seasons in the field my companions and I have sought, in vain, for the familiar rather thin-leaved plant with 3 stigmas and dark red berries which regularly passes as *S. lanceolata*. This species occurs in our extreme Southern States, Florida to Texas, north into South Carolina and Arkansas. I have seen no specimens of it from north of South Carolina. Everywhere in southeastern Virginia the coriaceous-leaved, evergreen *S. laurifolia* L. occurs, varying tremendously, with leaves from elliptic-oblong to narrowly lanceolate, obtuse to acuminate, the blades anywhere from 0.6–2 dm. long and 1–7.5 cm. wide. But it is always *S. laurifolia*, with intermittent tendrils, flowers expanding in autumn, black fruit ripening the second year, stigma and seed 1, etc. In its narrowest-leaved extreme, such as *Fernald & Long*, nos. 6778 and 13,919, its leaves are narrowly lanceolate and very close to those of the Plukenet figure. Of two sheets of one number retained at the Gray Herbarium, one has the branches as fiercely prickly as in Plukenet's illustration, while the second has them prickleless, as described by Linnaeus. Furthermore, the Plukenet figure is quickly matched by vigorous, prickly, narrow-leaved vegetative sprouts. It is most difficult for one who knows southeastern Virginia to believe that the plant inadequately described by Linnaeus as *S. lanceolata* was anything but the narrowest-leaved *S. laurifolia*, the type of which, as shown by the photograph before me, was the broad-leaved phase of the species.

Of great importance in interpreting the confused ideas of Linnaeus is the fact, that in *Species Plantarum*, after citing the reference to his brief account in *Hortus Cliffortianus* (which was based wholly or in part on the Plukenet figure) he appended "*Gron. virg.* 120." Now, if one looks in Gronovius he will find *Smilax* treated on pp. 120 and 193. On p. 120 two species have completed treatments, the third treatment was unfinished (as printed) and as an erratum was given on p. 193, "*Ibidem linea penultima lege.*" The first species on p. 120 had cordate-ovate leaves and was cited by Linnaeus under his *S. Pseudo-China*. Gronovius included under it "*Smilax humilior, floribus dilute luteis, baccis rubris. Clayt. n. 82*", which is, of course, *S. Walteri* Ell. (photograph of the Clayton plant before me). The second species in Gronovius, on p. 120, had "*caule angulato*

aculeato, foliis dilatato-cordatis" and included "Smilax late scandens Bryoniae nigrae foliis, caule spinoso . . . baccis atro-purpureis. *Clayt. n. 81*"; i. e., with angulate stems, leaves of Bryony and purple-black berries, it was one of the variations of *S. Bona-nox* L., surely not the red-berried so-called "*S. lanceolata*". The third species, revised on p. 193, with the admonition to substitute for the account on p. 120, was

*SMILAX caule spinoso tereti: foliis ovato-oblongis, trinerviis, inermibus. Smilax laevis Lauri folio, baccis nigris. Catesb. Hist. Carol. Vol. I. T. 15. Smilax sempervirens Lauri folio crasso: floribus parvis herbaceis; caule spinis rigidissimis armato; baccis nigricantibus. Clayt. n. 617.*

*Smilax laevis Lauri folio* of Catesby was the best kind of *S. laurifolia* L.; in fact it was cited by Linnaeus in publishing that species. So too was the *Smilax caule spinoso tereti* (with his own changes to "caule aculeato tereti", etc.) of Gronovius, p. 193. These, in fact, were the only bases of *S. laurifolia* L. (1753). Surely, there is not much left to stand for *S. lanceolata* L. as a distinct species! One sometimes doubts the wisdom of starting our nomenclature of American plants with Linnaeus (1753). It is almost an exceptional North American species about which he was not hopelessly confused.

As pointed out by Morong, Bull. Torr. Bot. Cl. xxi. 434 (1894), Asa Gray, thinking of *Smilax lanceolata* in the usually accepted but obviously erroneous sense, as the southern, thinnish-leaved plant with 3 stigmas and dark red 3-seeded berries, "examined in 1881 the specimens in the Herbaria of Enslin and Sherard upon which Pursh founded his species [*S. ovata* Pursh, Fl. Am. Sept. i. 249 (1814)], and declares positively that they are *Smilax lanceolata*". *S. lanceolata* sensu Gray, Morong, Small and others is, then, *S. ovata* Pursh, whose description was good except for "berries black". In the herbarium they always lose their red color. Unfortunately, however, *S. ovata* Pursh (1814) is antedated by a different *S. ovata* Jaume St.-Hilaire (1800).

The first available name for *Smilax ovata* Pursh, not Jaume St.-Hilaire, seems to be *S. SMALLII* Morong in Bull. Torr. Bot. Cl. xxi. 434 (1894). Morong described it from young flowering branches, with staminate flowers only, but a very full sheet of isotypic material before me is surely of the shrub erroneously passing as *S. lanceolata*. Small himself, in his Manual, reduces

to *S. lanceolata* sensu authors, not L., both *S. Smallii* Morong and *S. cinnamomifolia* Small in Bull. Torr. Cl. xxv. 609 (1898), the latter described as having "bluish-black" berries. In his Manual, where he reduces *S. cinnamomifolia*, the berries are called "dull-red". The type of *S. cinnamomifolia*, Heller, no. 4109, from Arkansas, was in ripe fruit. The isotype in the Gray Herbarium shows the crushed berries darkened, just as are the crushed and dried fruits of the admittedly red-berried shrub.

Until *Smilax Smallii* (*S. lanceolata* sensu most auth., not L.) is really collected in Virginia it may safely be excluded from the flora of the state.

FOUR OF RAFINESQUE'S SPECIES OF SISYRINCHIUM.—In his *Autikon Botanikon* (Cent. V), 65 and 66 (1840) Rafinesque, with the unusual clarity which contrasted much of his work in this rare volume with the slipshod technique of most of his publications, described four species of *Sisyrrinchium*. Since these were overlooked by Bicknell in his detailed study of the genus and find no mention in current floras, it is desirable to note their probable identities. The original descriptions are copied below.

481, *SISYRINCHIUM flexuosum* Raf. caule dichot. flexuoso anceps, fol. brevis ensatis acutis vix nervosis, spathis lanc. diphyllis ineq. fl. subeq. 3-4fl. capsulis ovoideis truncatis torulosis—Arkansas and Texas, semipedal, leaves 1 or 2 inches, specimens in fruit only.

482, *Sisyr. tenuifolium* Raf. caulib. cespitosis genicul. filif. 2ang. fol. tenuis angustissimis elong. lin. filif. acutis, spathis 2valvis subeq. lanceol. fl. brevior 2-5fl. petalis obt. cuspid. capsulis globosis—Arkansas and Texas, annual semipedal, leaves 2-4 inches long very slender, fl. blue, larger than in *S. anceps*.

483, *Sisyr. floridanum* Raf. Scaposum, fol. lin. lanc. acutis vix nervosis, scapis fol. subeq. lato bialatis, spathis ineq. bivalvis lanc. 2-4floris equante, petalis retusis cuspidatis, caps. obovatis—Florida, found by Baldwin, 4 to 6 inches high, annual leaves 2-4 inches, one line broad, flowers large white.

484, *Sisyr. niveum* Raf. scaposum fol. lin. angustis striatis nervosis acutis, scapis fol. longior bialatis, alis striatis, spathis sepe coloratis 3valvis, 2int. brevis subeq. 1 ext. longissima lanc. plicata, 6-8floris. petalis retusis cuspid. capsulis globosis—Alab. Kentucky &c, 6 to 8 inches high, leaves 3 to 5, half line wide, flowers size of *S. anceps*, snowy white, spathas more or less colored of red.

Species no. 481, *Sisyrrinchium flexuosum* Raf., not Spreng. (1825), is undoubtedly *S. minus* Engelm. & Gray in Bost. Journ. Nat. Hist. v. 263 (1845). The description might well have been based on the type of *S. minus*, and the description of *S. minus* in

Small's Manual emphasizes the short leaves (2–7 cm. long) and the capsule "corrugated". Rafinesque said "capsulis . . . torulosis." Although *S. flexuosum* Raf. was the earliest name for this southwestern species, it was antedated by *S. flexuosum* (L.) Spreng. **S. MINUS** stands.

Species no. 482, *S. tenuifolium* Raf., suffers the same fate. Rafinesque gave a good diagnosis of *S. Langloisii* Greene, Pittonia, iv. 32 (1899). Compare with Rafinesque's diagnosis these phrases from Greene's description of *S. Langloisii*: "Densely tufted and very slender . . . : leaves very narrowly linear, 2 to 4 inches long . . . : stems scarcely ancipital, rather subterete [Raf. said "filif."] . . . , . . . peduncles each with a single small few-flowered spathe, its bracts equal or nearly so . . . : . . . perianth large for so small a plant, blue." Characteristic plants of *S. Langloisii* closely match the account of *S. tenuifolium*. Rafinesque, however, was again out of luck, for there was an earlier *S. tenuifolium* Humb. & Bonpl. ex Willd. (1809). **S. LANGLOISII** stands.

Species 483, *S. floridanum* Raf., is more puzzling, on account of its large "white" flowers, for, so far as I can make out, no regularly white-flowered species occurs in Florida, unless possibly *S. albidum* Raf. Atl. Journ. 17 (1832). The "scapis . . . lato bialatis", their height and the leaves 1 line broad would do for *S. albidum*. It may so rest for the present. *S. floridanum* Raf. (1840), however, invalidates the name *S. floridanum* Bickn. in Bull. Torr. Bot. Cl. xxvi. 222 (1899), given to a very slender and pale plant first collected by Nash in high pineland of Lake County, Florida. Various coarser and darker-drying plants probably referable to *S. arenicola* Bickn. (incl. *S. fibrosa* Bickn.) have been wrongly distributed as *S. floridanum*, but an ISOTYPE (Nash, no. 13) and such material as Blanton, no. 6952 stand clearly apart. Since there is already a *S. Nashii* Bickn. his *S. floridanum* may appropriately be called

**SISYRINCHIUM Bicknellianum**, nom. nov. *S. floridanum* Bickn. in Bull. Torr. Bot. Cl. xxvi. 222 (1899), not Raf. Aut. Bot. 66 (1840).

Rafinesque's species no. 484, *S. niveum* from Alabama and Kentucky, can scarcely be anything but his already described *S. albidum* Raf. Atl. Journ. 17 (1832).

QUERCUS INCANA Bartram, Trav. 378 (1791). *Q. cinerea* Michx. Fl. Bor.-Am. ii. 197 (1803).

I fully concur in the decision of Dr. Francis Harper in *Bartonia*, no. 22: 3 (1943), that *Quercus incana* is *Q. cinerea*. Bartram's description was very brief: "Q. incana, foliis ovalibus integerrimis subtus incanis." Bartram was describing the trees and shrubs of high gravelly ridges of the upper Ogeechee River in central-eastern Georgia: "This day's journey was for the most part over high gravelly ridges, and on the most elevated hills appeared emerging out of the earth, rocky cliffs of a dark reddish colour; their composition seemed to be a coarse, sandy, ferruginous concrete . . . The trees and shrubs common on these gravelly ridges are as follows, Diospyros, Quercus rubra [meaning *falcata*], Q. nigra, Q. tinctoria or great Black Oak, Q. alba, Q. lobata, post White Oak, Q. incana, . . . Pinus lutea, Pinus taeda, . . . Pinus palustris", etc., a rather characteristic group of oxylophytic and more or less xerophytic species. These are the regular associates of *Quercus cinerea*, a characteristic species of dry sands and gravels, which, according to R. M. Harper, *Phytog. Sk. Altamaha Grit Reg. of Ga.* Ann. N. Y. Acad. Sci. xvii. pt. I. 249 (1906), "Ranges from the fall-line sand-hills [near Bartram's station] almost to the coast". Ordinarily the leaves of *Q. cinerea* are oblong, but they vary to oval or elliptic in broader-leaved individuals (Small says, "blades elliptic, varying to lanceolate or oblanceolate . . . Sand-ridges, dry woods, and pinelands.")

Trelease, *The American Oaks*, Mem. Nat. Acad. Sci. xx. 113 (1924), guessed that *Q. incana* Bartr. is the Live Oak, *Q. virginiana* Mill., but Bartram was thoroughly familiar with Live Oak; in fact he mentioned it more often than any other species and would not suddenly, in describing the characteristic covering of the inland Sand Hills, proceed to describe it as a novelty. *Quercus virginiana*, the true Live Oak, so familiar to Bartram, is, from Virginia to Georgia, an evergreen tree primarily of the outermost Coastal Plain. Harper, op. cit., did not know it on the Altamaha Grit which, at its northern boundary, approaches Bartram's station of *Q. incana*. The only representative of *Q. virginiana* in Harper's area is *Q. geminata* Small, which Bartram would have included under *Q. virginiana* and which is

found only well to the south of Bartram's area and in a different soil. So far as I can find, *Q. cinerea* is the only species of the "fall-line sand-hills" which Bartram could have meant by *Q. incana*.<sup>1</sup>

**QUERCUS MARITIMA** Bartr. Trav. 164 (1791). From the "endless wild desert, the upper stratum of the earth of which is a fine white sand, with small pebbles, and at some distance appears entirely covered with low trees and shrubs of various kinds, and of equal height", along St. John's River north of Lake George, eastern Florida. From the description alone, "foliis obcuneiformibus obsolete trilobis minoribus", I do not venture to guess its identity. Too many shrubby species of Florida are candidates. Bartram's *Q. maritima* (1791), however, antedates *Q. maritima* (Michx.) Willd. (1805) and Raf. (1838). The last two were caught by *Index Kewensis*, the earliest of the series not.

**SILENE SCABRA** Raf. Aut. Bot. 18 (1840), from "barrens of West Kentucky", is very definitely *S. REGIA* Sims (1814). Rafinesque's name, moreover, is invalidated by *S. scabra* Kit. (1814).

**PRUNUS NEMORALIS** Bartr. Trav. 408 (1791) should be added to the synonymy of *Padus caroliniana* Mill. Dict., no. 6 (1768) and of **PRUNUS CAROLINIANA** (Mill.) Ait. Hort. Kew. ii. 163 (1789).

Barton's species, not entered in *Index Kewensis*, was from above Mobile, Alabama: "Prunus nemoralis, floribus racemosis, foliis sempervirentibus, nitidis."

**SEBASTIANIA fruticosa** (Bartram), comb. nov. *Stillingia fruticosa* Bartr. Trav. 476 (1791). *Stil. ligustrina* Michx. Fl. Bor.-Am. ii. 213 (1803). *Sebastiania ligustrina* (Michx.) Muell.-Arg. in DC. Prodr. xv.<sup>2</sup> 1165 (1866).

*Index Kewensis* cites *Stillingia fruticosa* as starting with Spreng. Syst. iii. 805 (1826), while Sprengel credited it to Michaux (1803) who had no such name but described *Stil. ligus-*

<sup>1</sup> Even though some might doubt this interpretation of *Q. incana* Bartr. (1791) they can hardly doubt its priority over *Q. incana* Roxb. Hort. Beng. 104 (1814) and Fl. Ind. iii. 642 (1832). The Indian species should, apparently, be called *Q. lanata* Sm. in Rees Cycl. xxix. no. 27 (1819).



*trina* from "sylvaram umbrosis, ad ripas amnium Carolina et Georgia." Bartram, however, describing the "very curious and beautiful flowering and sweet scented shrubs" northwest of Cape Fear, North Carolina (near Wilmington), enumerated many of them: "particularly Callicarpa, Aesculus pavia, . . . Sty-rax, Stewartia, . . . Stillingia fruticosa, foliis lanceolatis, utrinque glabris, fructu tricocco". Though brief, the diagnosis of this characteristic shrub of the Coastal Plain, northward to southeastern North Carolina, is sufficient. M. A. Curtis in his Catalogue of the Indigenous and Naturalized Plants of North Carolina (1867) cited *Stil. ligustrina* as occurring in the "Low Dist.", *i. e.* on the Coastal Plain, and Wood and McCarthy in their Wilmington Flora, covering the country drained by both the Northeast and the Northwest Cape Fear Rivers, also listed it. In both lists the species is recorded on the authority of Dr. J. F. McRee, who was born at Wilmington and later had a plantation some miles north of that city.

CYRILLA RACEMIFLORA L., var. **subglobosa**, var. nov. (TAB. 813, FIG. 1 et 2), foliorum venis subtus vix prominulis; sepalis ovatis 1 mm. longis; fructibus depressis subglobosis sulcatis; stigmatibus perbrevibus.—VIRGINIA: wooded swamp along Mill Creek, about 1 mile north of Skipper's, October 14, 1938, *Fernald & Long*, no. 9600 (TYPE in Herb. Gray.; ISOTYPE in Herb. Phil. Acad.).

Typical *Cyrilla racemiflora* has a characteristic conic-ellipsoid or -ovoid drupe definitely longer than broad, though in exceptional specimens only slightly longer. In ripe material the drupes (FIG. 3) show a continuous rounded surface with little or no sign of furrowing and the styles and stigmas are rather prominent, the lanceolate to lance-ovate sepals are 1–1.8 (usually 1.5) mm. long, their sharp tips evident beyond the half-diameter of the fruit. In typical *C. racemiflora*, furthermore, the mature foliage is usually prominently reticulate-veiny beneath. Var. *subglobosa*, the type in ripe fruit, collected in mid-October, has the reticulum of the lower, as well as the upper, leaf-surface rather faint; the sepals are the shortest in the species, 1 mm. long and ovate; and the depressed-subglobose drupes (FIGS. 1 and 2), definitely as broad as or broader than high, so that the sepals are relatively hidden, are broadly rounded to an almost emarginate summit and with a deep longitudinal furrow running

from base to apex and marking the boundaries of the 2 carpels; the style and stigmas are the shortest in the species.

Although occasional specimens of the wide-ranging and more typical *Cyrilla racemiflora* approach in one character or another the shrub from near Skipper's, the latter combines so many of these exceptional characters that I am designating it as a variety. Flowering material may show other differences.

In shape of drupe Var. *subglobosa* suggests the fruit described by Rafinesque for his *Cyrilla polystachya* Raf. Aut. Bot. 8 (1840), with "capsulis subglobosis". That shrub of Louisiana and Florida was described, however, as having the "fol. . . . imis . . . acutis . . . racemes 6 to 8 inches". It is most probably a phase of the narrow-leaved and small-fruited *C. parviflora* Raf., l. c., which differs in several characters from *C. racemiflora*.

IN PLATE 813, FIGS. 1 and 2 are of TYPE of CYRILLA RACEMIFLORA L., var. SUBGLOBOSA: FIG. 1, portion of branch,  $\times 1$ ; FIG. 2, portion of fruiting raceme,  $\times 5$ . FIG. 3 is a portion of a fruiting raceme of typical *C. RACEMIFLORA*,  $\times 5$ , from west of Winfield's Mill, Dinwiddie County, Virginia, Fernald & Long, no. 13970.

AESCULUS SYLVATICA Bartr. Trav. 476 (1791). *Ae. neglecta* Lindl. Bot. Reg. xii. t. 1009 (1826); Sargent in Journ. Arn. Arb. v. 43 (1924).

The tree known as *Aesculus neglecta* is characteristic of woodlands along streams in central and eastern North Carolina and southeastern Virginia. In the latter state it reaches the inner border of the Coastal Plain along the Meherrin River, below Emporia. From North Carolina Sargent cites specimens from the Piedmont eastward to the fall-line sand-hills or the inner margin of the Coastal Plain: Alamance, Orange, Durham and Wake Counties, on Cape Fear drainage or (the Wake County station) on the Neuse. According to Lindley's original account and plate the flowers are cream-colored or pale-yellowish, "and beautifully veined with red; the lateral petals are also pinkish". The red and pink coloring may sometimes be nearly absent but the non-glandular pedicels and calyx, which characterize the species, hold. Bartram, ascending "the North West of Cape Fear" River, found "*Aesculus sylvatica*, floribus ex albo et carneo eleganter variegatis, caule arboreo". What else could it have been than *Ae. neglecta*, with "flowers . . . beautifully

veined with red", the species characteristic of eastern North Carolina and adjacent Virginia, South Carolina and Georgia, which Sargent cites from definite stations on Cape Fear River? The name was not recorded in Index Kewensis.

Neither did Index Kewensis pick up *Aesculus floridana* Bartram, l. c. 401 (1791) from northern Florida, described: "Aesc. Florid. ramis divaricatis, thyrsis grandis, flosculis expansis incarnatis." What he had I do not know. He was definitely distinguishing it from *Ae. Pavia* which he enumerated in the same list. If the latter species is ever subdivided Bartram's species must be taken into account.

VITIS CAMPESTRIS Bartram, Trav. 400 (1791), not Nutt. in Fraser's Cat. (1813) nor Baker in Mart. Fl. Bras. xiv<sup>2</sup>. 200 (1871). *V. rotundifolia* Michx. Fl. Bor.-Am. ii. 231 (1803).

*Vitis rotundifolia*, the Muscadine, and its pale-fruited form, the Scuppernong, are among the most familiar and most prized wild grapes of the Southeastern States. When fully ripe the large grapes are intensely sweet and are harvested in great quantities for preserving. Unlike the great majority of our grapes, this species has few and simple tendrils, instead of many and forking ones. Consequently, although it may climb high when opportunity presents, it is most often sprawling over bushes or reclining on the sand or gravel, so that, in such habitats, its often too tempting and almost over-sweet berries are gathered by stooping. Thus, Elliott said: "This species of vine varies much in size, sometimes ascending the loftiest trees, more frequently humble" (Sk. ii. 687) and Darby said "sometimes not climbing". As to the fruit, Mohr (Pl. Life Alab. 6: 3), pays it the compliment which he accords no other species of Alabama: "Important as a table and wine grape" and, after speaking of the "Berries large, plum-purple", he adds: "Plants of spontaneous growth have been observed near Mobile bearing light amber-colored berries."

Bartram's party, crossing northern Florida en route to Mobile, where "Our road now for several miles led us near the Alabama", eventually left "the Alabama bearing away Southerly, and enter[ed] a vast open forest which continued above seventy miles, East and West, without any considerable variation . . . . During our progress over this vast high forest, we crossed extensive open plains, the soil gravelly, producing a few trees and

shrubs or undergrowth, which were entangled with Grape vines (*Vitis campestris*) of a peculiar species [*Vitis rotundifolia* Michx. is so "peculiar" in many characters that Small makes it a separate genus, *Muscadina*], the bunches (racemes) of fruit were very large, as were the grapes that composed them, though yet green and not fully grown, but when ripe are of various colours, and their juice sweet and rich. The Indians gather great quantities of them, which they prepare for keeping, by first sweating them on hurdles over a gentle fire, and afterwards dry them on their bunches in the sun and air. and store them up for provisions: these Grape vines do not climb into high trees, but creep along from one low shrub to another, extending their branches to a great distance horizontally round about [Bailey, *Gent. Herb.* iii. 238, says of *V. rotundifolia* "climbing to 100 feet over bushes and trees"], and it is very pleasing to behold the clusters pendant from the vines, almost touching the earth, indeed some of them lie upon the ground." I have many times gathered from near the ground or from the surface of sand-hills or dunes and eaten more than my fill of the "very large . . . grapes [Michaux described his *V. rotundifolia* *baccis magnis*"], . . . their juice sweet and rich" of *V. rotundifolia*. Not only did the Indians of northwestern Florida and of Alabama gather and dry the large and sweet grapes "and store them up for provisions." Their successors in occupation of the region continue the custom, with obvious refinements. In his *Nature's Garden for Victory and Peace*, revised (*Bull. Tuskegee Inst. Alab.* no. 42), the late Dr. George W. Carver, ignoring the other 5 (and sour-fruited) species of *Vitis*, concentrated on the Muscadine, giving explicit directions for cleaning and preparing the fruits, after which "They may be dried whole or made into a leather . . . I much prefer the leather . . . of a fine flavor . . . I wish every housewife would try this." To those who intimately know the Muscadine and the Skuppernong, their growth-habit and fruit there can be no serious question that *V. campestris* Bartr. (1791) is the same as *V. rotundifolia* Michx. (1803). The change of name would have been made a half-century ago if Bartram's species had not been ignored by the editors of *Index Kewensis*.

AMMANNIA TERES Raf. *Aut. Bot.* 39 (1840). *A. Koehnei* Britton in *Bull. Torr. Bot. Cl.* xviii. 271 (1891).

Rafinesque certainly had the plant of fresh to brackish tidal shores of Virginia to Florida (once in the Hackensack marshes of New Jersey) which Britton described as *Ammannia Koehnei*.

Rafinesque's description was good:

296, *Am. teres* Raf. caule teres vix ramoso fol. obl. obt. carnosus, caulinis basi cord. ad medio. angustatis, rameis cuneatis brevis, fl. sepe solit—Virg. ad Carol. pedal, leaves twice as broad as in last, broader at both ends.

This necessitates the new combination:

*A. TERES*, var. **exauriculata** (Fernald), comb. nov. *A. Koehnei*, var. *exauriculata* Fernald in RHODORA, xxxviii. 437, tab. 449, figs. 4 and 5 (1936).

The "last", referred to above by Rafinesque, was his *AMMANNIA MULTICAULIS*, l. c. (1840). This was evidently *Rotala ramosior* (L.) Koehne, with the virgate stems simple, "fol. linearib., acutis, fl. sepe vertic—Virginia, pedal, leaves uncial", while no. 294, *A. LINEARIFOLIA*, cited as the same as *A. ramosa* of authors, but with "fol. linearib. obt. nonnullis basi dilatatis" was *ROOTALA RAMOSIOR*, var. *INTERIOR* Fern. & Griseb.

*A. LONGIFOLIA* Raf. l. c. (1840) from its excellent description and the region, "Arkansas and Louisiana," was *A. COCCINEA* Rottb. (1773); and *A. DIFFUSA* Raf. l. c. (1840) is apparently *A. AURICULATA* Willd. (1806).

None of these species of Rafinesque are recorded in Index Kewensis.

*HERACLEUM MAXIMUM* Bartr. Trav. 344 (1791). *H. lanatum* Michx. Fl. Bor.-Am. i. 166 (1803).

It is with real sadness that I seem forced to relinquish so long established and familiar a name as *Heracleum lanatum* Michx. But the species, which in the East extends south along the mountains to Georgia (*Small*), was detected by Bartram in the mountains of northwestern Georgia and briefly but passably described: "I observed growing in great abundance in these mountain meadows, *Sanguisorba Canadensis* and *Heracleum maximum*, the latter exhibiting a fine shew, being rendered conspicuous even at a great distance, by its great height and spread, vast pinnatifid leaves and expansive umbels of snow-white flowers." We are sorry to give up the long established name; we should have been familiar with Bartram's earlier one had it been picked up, as were several names in the same book,<sup>1</sup> in

<sup>1</sup> Such names as *Anona pygmaea*, basonym of *Asimina pygmaea* (Bartr.) Gray; *Andromeda formosissima*, *Stewartia montana*, etc

*Index Kewensis*. Incidentally, the type of *Heracleum lanatum* consists of a portion of leaf of the *Heracleum* and a fruiting umbel of *Pastinaca sativa*!

THE PLANTS PASSING AS PHACELIA HIRSUTA (PLATES 814–816).

**PHACELIA fallax**, sp. nov. (TAB. 814), a *P. hirsuta* differt foliorum caulinarum lobis terminalibus cuneato-obovatis segmentis oblongo-obovatis; caulibus pedicellisque minutissime pilosis strigosisque; sepalis adscendentibus deinde tuberculato-ciliatis extus glabris vel glabratis intus glabris; seminibus transverse lineato-rugosis.—Mountain-region, western Virginia to Georgia. VIRGINIA: Giles County, May, 1869, *Canby*. GEORGIA: Stone Mountain, May, 1869, *Canby*, May 13, 1897, *Biltmore Herb.*, no. 4263, May 3, 1899, *Canby & Sargent*, May 24, 1899, near summit, *A. H. Curtiss*, no. 6458 (TYPE in Herb. Gray.), April 16, 1932, thin soil on slope, *E. J. Palmer*, no. 39,909; slope of Pine Mountain, 1 mile north of Lithonia, April 28, 1934, *Perry & Myers*, no. 998.

*Phacelia fallax* has been mistaken for *P. hirsuta* Nutt. in Trans. Am. Phil. Soc. v. 191 (1837), our PLATE 815, FIGS. 1–3; and Brand in Engler, Pflanzenr. iv<sup>251</sup>. 65 (1913) gave under the name *P. hirsuta* a description of *P. fallax*, based exclusively on the plant of Stone Mountain (the Biltmore and the Curtiss exsiccatae), Brand specially emphasizing the tuberculate-based cilia of the sepals and the broad lobing of the leaves and saying: "Von anderen Standorten nicht gesehen. Gray gibt die Pflanze ferner an für M i s s o u r i b i s O s t t e x a s." The latter, the region from which Brand saw no material, is the real area of *P. hirsuta* Nutt. Nuttall's species is definitely HIRSUTE; the TYPE OR ISOTYPE (PLATE 815, FIG. 1) in the Gray Herbarium closely matches the original description of the species which came from "sylvan prairies" in Arkansas, in having the summit of the stem and the pedicels spreading-hirsute, the "pectinately-pinnatifid" leaves with linear segments, and the sepals during anthesis widely spreading. It is matched by a few collections from Arkansas, Oklahoma and eastern Texas; and Mr. Long sends me for checking a characteristic specimen, collected as an adventive, near Telford, Pennsylvania, June 14, 1901 by Dr. C. D. Fretz. The contrasts between the two species are given below and in PLATES 814 and 815.

*P. HIRSUTA*: principal cauline leaves deeply or pectinately pinnatifid, with linear to linear-lanceolate segments; summit of stem and pedicels spreading-hirsute as well as pilose; sepals during anthesis widely spreading to slightly reflexed, later ascending, their margins ciliate-hirsute with mostly slender-based hairs, the upper surfaces strigose. PLATE 815, FIGS. 1-3.

*P. FALLAX*: principal cauline leaves with terminal cuneate-obovate lobe rarely cleft to the middle, the broader segments oblong to oblong-obovate; stem and pedicels minutely pilose, sometimes also strigose; sepals in anthesis appressed-ascending, their margins when mature ciliate with tuberculate- or pustular-based hairs, their upper surfaces glabrous. PLATE 814.

The habitat of *Phacelia fallax* is rarely given on the labels before me. Such as indicate it say thin soil or mountain-slopes (in Georgia on granitic rock). Small, familiar with *P. fallax*, rather than *P. hirsuta*, says "Dry soil, rocks and open woods"; and McVaugh<sup>1</sup>, who, like Brand, defines as the western *P. hirsuta* Nutt. the plant of Stone Mountain and vicinity with hairs of the sepals "often enlarged at base and terminating in raised pustules or teeth on the sepals," cites it for Georgia as a secondary member of the flora of the granite flat-rocks. Its habitat in Giles County, Virginia, is not recorded but since McVaugh's map (his fig. 1) of granitic outcrops of the eastern United States, showing them to extend northward across Virginia, indicates none of them in or very near Giles County, it is safe to say that there it was not found on granite. The localities in Georgia are, quite clearly, thin and subarid acid soil.

The locality for *Phacelia fallax* in Giles County, Virginia, cited by Gray, Syn. Fl. ii<sup>1</sup>. 164 (1878), by Brand, l. c. (1913) and the basis for the inclusion of Virginia in the range of the composite *P. hirsuta* in Gray's Manual and in Small's Manual, if taken into account by McVaugh, would have changed the tiny ellipse in northern Georgia (on his fig. 29) to an elongate tongue reaching western Virginia.

The habitats of true southwestern *P. hirsuta* (Arkansas, Oklahoma and Texas), on the other hand, are given as follows on the labels in the Gray Herbarium and in the Bebb Herbarium of the University of Oklahoma, the latter material kindly sent me for examination by Dr. Milton Hopkins, in addition to Nuttall's "sylvan prairies": wet prairie, Arkansas, *Bush*, no. 258; field,

<sup>1</sup> McVaugh, *The Vegetation of the Granite Flat-Rocks of the Southeastern United States*. Ecol. Monogr. xiii., especially p. 158 and fig. 29 (map) on p. 163 (1943).



Photo. B. G. Schubert.

PHACELIA HIRSUTA: FIG. 1, TYPE OF ISOTYPE,  $\times 1$ ; FIG. 2, portion of inflorescence,  $\times 3$ ; FIG. 3, seed,  $\times 10$   
 P. GILIOIDES: FIG. 4, plant,  $\times 1$ ; FIG. 5, young inflorescence,  $\times 3$ ; FIG. 6, seed,  $\times 10$





*Photo. B. G. Schubert.*

PHACELIA DUBIA: FIG. 1, young inflorescence,  $\times 3$ ; FIG. 2, portion of mature inflorescence,  $\times 3$ ; FIG. 3, seed,  $\times 10$

Var. INTERIOR: FIG. 3, portion of mature inflorescence,  $\times 3$ , from TYPE

Ark., *F. L. Harvey*, no. 12; limestone, hillside, Ark., *Damaree*, no. 14830; wet places, Oklahoma, *McClary*, May, 1935; meadow soil, Okla., *DeVitt and Clark*, no. 50; prairies, Okla., *Robert Bebb*, no. 3856 and *Demaree*, no. 12,646; on slough, Okla., *Richard F. Mason*, no. 127; shaded bank of slough, Okla., *R. F. Mason*, April 14, 1937; creek-banks and open woods, Okla., *Houghton as Stevens*, no. 2137; dense shrubbery along small stream, Okla., *E. L. Little, Jr.*, no. 128; wooded grassy glade in river-valley, Okla., *Hopkins*, no. 2943; wooded hills, Okla., *Goodman*, no. 2137; granite hills, Okla., *P. B. Sears*, no. 1317; dry sandstone ledges and boulders in oak-hickory forest, Okla., *Hopkins and Cross*, no. 1487; sandy soil, Okla., *V. Johnson*, no. 116; arid hillside, Okla., *M. Fielder*, April 20, 1927. The southwestern *P. hirsuta*, then, is evidently more calcicolous and less xerophytic than the southeastern *P. fallax*.

The Missouri dots for *Phacelia hirsuta* on McVaugh's map (his fig. 29) were presumably based on material of *P. gilioides* A. Brand (our PLATE 815, FIGS. 4-6). At least, all the Missouri specimens in the Gray Herbarium which were sent out as *P. hirsuta* are *P. gilioides*, a grayish or canescent plant with leaves cut into linear or linear-lanceolate segments, the stem and pedicels canescent-pilose without hirsute pubescence, the appressed calyx strigose, the corolla relatively small, its lobes undulate to dentate. It is *P. GILIOIDES* (misidentified as *P. hirsuta*) which Palmer & Steyermark assign in Missouri to "Rocky prairie, glades, ledges along bluffs, low rich woods, and alluvial ground along streams. Calciphile to circumneutral." The Oklahoma material in the Bebb Herbarium and the Gray Herbarium shows the following habitats: creek-bank, *Stevens*, no. 1377; prairies, *Robert Bebb*, nos. 3850 and 5090, *Ezra Brainerd*, April 12, 1908; prairies and wood-openings, *Robert Bebb*, no. 3884; woods, *Mrs. W. L. Ducker*, no. 39; shale, rocky mountain, April 6, 1941, *H. Randel Griffith*; rocky hills, *Robert Bebb*, no. 2720 and May, 1935, *J. E. McClary*; vacant lots and waste lands, *Auval H. Brown*, no. 18; cottonfield, April 19, 1927, *R. E. Jeffs*. Like *P. hirsuta*, it is also calcicolous and scarcely a xerophyte.

In *Phacelia dubia*<sup>1</sup> (PLATE 816) the sepals are unequal, the

<sup>1</sup> Although the combination *Phacelia dubia* (L.) Trel. is here credited to Trelease, it is done so under strong mental protest. The combination was published by Trelease in Branner & Coville, Ann. Rep. Geol. Surv. Arkansas for 1888, iv. 205 (1891)